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REMARKS

Claims 5-18 are pending in the present application. Claims 1-4 were previously cancelled. No new matter has been added.

Claims 5-18 have been rejected under 35 U.S.C. § 103(a) as being unpatentable over Allison (U.S. Patent No. 4,047,195), as previously applied and further in view of Hwang, et al. (U.S. Patent No. 4,833,516, hereinafter "Hwang"). Applicants respectfully traverse these rejections.

At page 3, first paragraph, of the Office Action, the Examiner states that figure 3 and column 2, lines 20-35 of Hwang show "said perpendicular sidewalls of the upper portion of the trench disposed in different crystallographic planes." The Examiner is correct that figure 3 shows the sidewalls of trench 16 to be perpendicular to the surface. However, there is no teaching at all that the sidewalls are in different crystallographic planes. In fact, the only evidence or disclosure of the orientation of the sidewalls of trench 16 in substrate 10 is the layer 42 shown in figure 4 of Hwang, which was epitaxially grown on top of substrate 10. As is well known by those skilled in the art, the epitaxially grown silicon layer 42 would almost certainly follow the crystalline structure or pattern of silicon substrate 10. Therefore, since the opening in silicon layer 42 shows the sidewalls that are perpendicular to the surface in the same crystallographic plane as the surface (i.e., both the surface of layer 42 and the sidewalls of the opening in layer 42 are in the <100> crystallographic plane), all of the perpendicular sidewalls of the rectangular shaped trench 16 of epitaxial layer 42 *will* be in the <100> crystallographic plane. Therefore, the sidewalls of trench 16 shown in figure 3 are only in crystallographic

plane $\langle 100 \rangle$ (figure 4 shows the orientation of the planes). Similarly, at page 3, third paragraph of the rejection, the Examiner alleges that in figure 4 and at column 3, lines 20 through 42, Hwang “describes sidewall portions in at least the 100 and 110 crystallographic planes.” This statement ignores the facts of the case and is misleading. It is true that the opening in layer 42 shown in figure 4 does describe sidewall portions of the *opening* in the $\langle 100 \rangle$ and $\langle 110 \rangle$ crystallographic planes. However, the opening in layer 42 is not the trench and as was clearly shown above, the trench sidewalls only lie in the $\langle 100 \rangle$ crystallographic plane. They clearly do not lie in both the $\langle 100 \rangle$ and $\langle 110 \rangle$ crystallographic planes. More importantly, it is seen that the angled sidewalls that lie in a different crystallographic plane (i.e. plane $\langle 110 \rangle$) in epitaxial layer 42 are not perpendicular to the surface. Therefore, the sidewalls having a crystallographic plane orientation of $\langle 110 \rangle$ in Hwang do not meet the limitation that the sidewalls be perpendicular to the surface. More simply put, all of the sidewalls that are perpendicular to the surface are in the same crystallographic plane (i.e. plane $\langle 100 \rangle$), not different crystallographic planes, and the sloping or non-perpendicular sidewalls in the $\langle 110 \rangle$ crystallographic plane that are in a plane different from the sidewalls in the $\langle 100 \rangle$ crystallographic plane are not perpendicular to the surface.

In that same third paragraph on page 3, the Examiner continues his misinterpretation of Hwang by stating “... and said second plane *also* perpendicular to said surface...” (emphasis added). However, as clearly shown above, the sidewalls in the $\langle 100 \rangle$ crystallographic plane may be perpendicular to the surface, but the sidewalls in the $\langle 110 \rangle$ crystallographic plane certainly are not. In the fourth paragraph of page 3, the Examiner then combines Allison and Hwang to make his 35 U.S.C. § 103(a) obviousness

rejection. Applicants submit that there is no motivation whatever to combine Allison and Hwang. However, regardless of whether there is motivation to combine the references or not, it is clear from the above discussion that even when combined, Allison and Hwang *do not* disclose the unique features of the claimed invention.

The Examiner continues to misread Allison in the first full paragraph of page 4 of the Office Action with respect to the quote “remaining of limitations of claim 5,” stating that Allison and Hwang disclose “. . . a second layer of silicon dioxide grown on said second sidewall portion at a second rate and *on said first layer* of said silicon dioxide material...” (emphasis added). However, in the next full paragraph (beginning with the phrase “the recitation”), and in the last paragraph (also beginning with the phrase “the recitation”), the Examiner dismisses most of the claim language as either being new matter or “product by process” language and refuses to give any patentable weight to the claim language. Therefore, Applicants will only discuss the structural differences of *the second layer of silicon dioxide on the first layer of a silicon dioxide material* at this point. The new matter issue and the product by process issue will be discussed in great detail later. Therefore, with respect to structure that the Examiner has not related to the new matter issue or the patent product by process issue, it is submitted that neither Allison nor Hwang even suggest, much less teach, “a second layer of silicon dioxide on the first layer.” More certainly, it is clear that neither Allison nor Hwang can disclose or teach the *structural limitation* that the thickness of the second layer on the second sidewall portion is substantially equal to the thickness of both the first and second layers of silicon dioxide on the first sidewall portion since neither of these references even teaches a second layer of silicon dioxide over a first layer of silicon dioxide.

It is therefore respectfully submitted that the limitation of a second layer on a first layer is, by itself, sufficient to distinguish claim 5 from both Allison and Hwang, and certainly that the limitation that the second layer of material on the second portion is equal to the thickness of combined layers on the first portion is unique.

As indicated above, the Examiner dismisses the limitation that the trench sidewall portions are perpendicular to the surface as new matter. In the response to the previous Office Action dated July 14, 2006, at pages 6 and 7, Applicants explained in detail the support in the original specification and drawings that disclose and clearly teach this limitation. This support in the original specification and drawings clearly shows that there was no proper or legitimate new matter issue that could be raised by the Examiner. However, the Examiner does not even discuss much less attempt to rebut Applicants' position or arguments to show why Applicants are wrong. The Examiner simply ignores the clear proof and states that the limitation is considered new matter for reasons set out above (presumably in the July 14, 2006 Office Action). Applicants submit that such a cavalier dismissal is improper.

On another matter related to the new matter issue, it is noted that in the July 14, 2006 Office Action, the Examiner refused to enter portions of the Preliminary Amendment of April 24, 2006 to the specification (see first paragraph of page 3 of the July 14, 2006 Office Action) on the basis of new matter. However, although the Examiner entered the October 11, 2006 Amendment, it is noted that in that October Amendment, as discussed above, Applicants also strongly argued why the amendments to the specification should properly be entered. Unfortunately, the Examiner did not even mention, much less advise Applicants whether or not he had now entered the amendments

to the specification. As clearly mentioned in the October 11, 2006 response at page 6, second paragraph, after the telephone conference with the Examiner, Applicants were of the understanding that the Examiner was going to enter the amendments set forth in the April 24, 2006 Preliminary Amendment. It is respectfully submitted that in the October 11, 2006 response, Applicants stated this understanding that the Examiner was going to enter the changes to the specification that were included in the Preliminary Amendment, and this statement met the requirements of the MPEP under 713.04. If this was not a correct understanding by Applicants, or if the Examiner changed his mind, Applicants respectfully submit that in view of the telephone conferences and the stated understanding in the October 11, 2006 response concerning this matter, the Examiner certainly should have advised Applicants before issuing the Final Office Action so that Applicants could have made a more current attempt to understand the basis of the Examiner's refusal and made further arguments that perhaps could have persuaded the Examiner and avoided the present arguments.

In any event, Applicants are not now sure whether or not the complete Preliminary Amendment was entered as Applicants understood from the telephone conference. Consequently, Applicants request clarification on this matter. However, as a result of the new matter rejection, and since there is no clear indication of the Examiner's position, Applicants are compelled to assume the complete Preliminary Amendment was not entered. In any event, if the Examiner has not entered the complete Preliminary Amendment, Applicants believe they still have every right to include any issue raised in the non-entered Amendment to the specification in an appeal or pre-appeal brief conference without having to file an RCE.

However, as discussed above, it is believed that it would be very clear to a person skilled in the art that with or without the changes to the specification included in the Preliminary Amendment there is ample disclosure in the original specification and drawings to support the claim limitation or requirement that the sidewall portions are perpendicular to the surface, and that the Examiner's position that this is new matter is absolutely without any basis.

Finally, the Examiner apparently even dismisses the clear structural limitations of the last element of claim 5 on the basis that some methodology related material is included in the claimed element. This is improper. More specifically, even ignoring all of the methodology related material in the last element of claim 5, there are structure limitations that still clearly define over both Allison and Hwang. For example, the structure portion of the claims still require a

"a second layer of silicon dioxide . . . on both said second sidewall portion . . . and on said first layer of said silicon dioxide material . . . the thickness of said second layer of silicon dioxide on said second sidewall portions is substantially equal to the thickness of both said first and second layers of silicon dioxide on said first sidewall portions."

The above quote is the last element of claim 5 with all of the methodology language removed, and as discussed, there are still significant structural limitations remaining. It is submitted that the Examiner has no right to ignore these structural limitations set out in this element regardless of what he chooses to do with the methodology language. It is further noted that neither Allison nor Hwang teaches these structures and limitations and the Examiner has made no attempt to show that they do.

Further, the Examiner has not offered any basis whatsoever to dismiss the structural portions of the claim element.

Therefore, this claim element alone also clearly distinguishes claim 5 over Allison and/or Hwang.

Claim 6 was rejected for substantially the same reasons as claim 5 and therefore the arguments proffered for claim 5 were equally applicable to claim 6.

With respect to claim 7, it is clear that the sidewall portions of Allison are not perpendicular to the surface, much less two sidewall portions being perpendicular to the surface.

With respect to claim 9, Allison simply does not disclose another layer of silicon dioxide on the relative thin material layer, much less another layer with the features of claim 9.

With respect to claim 12, as discussed above, the sidewall portions of the Allison structure are not perpendicular to the surface.

In view of the above, Applicants respectfully submit that this response complies with 37 C.F.R. § 1.116. Applicants further submit that the claims are in condition for allowance. No new matter has been added by this amendment. If the Examiner should have any questions, please contact Applicants' attorney at the number listed below. No fee is believed due in connection with this filing. However, in the event that there are any fees due, please charge the same, or credit any overpayment, to Deposit Account No. 50-1065.

Respectfully submitted,

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Date

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